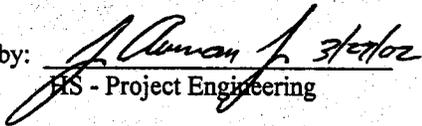


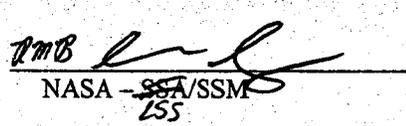
NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
REAL TIME DATA SYSTEM HARNESS, ITEM 156 ----- SV789134-2 (1)	2/2	156FM04 Electrical short or open in earphone lines. Cable chafing against connector shell or shield. Improper connector strain relief. Faulty connection between connector and the lead wires.	END ITEM: Open circuit or short to ground in earphone or microphone lines. GFE INTERFACE: Loss of ability to receive radio signals. MISSION: Loss of one EMU. Terminate EVA. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Each connector/cable interface is strain relieved by potting the connectors in place with a rubber boot molded over and teflon coated. Wire is #24 AWG Teflon insulated and connectors are crimped per SVHS4909, Type II to provide electrical and mechanical properties to prevent breaking or shorting. Each connector/adaptor ring interface is locked in place to prevent rotation by a mechanical lock and an adhesive lock. B. Test - Component Acceptance Test - The 156 harness is subjected to acceptance testing per AT-EMU-156 prior to final acceptance testing. This testing includes the following tests which insures there are no workmanship problems which would cause an electrical short to ground or an open circuit in the earphone lines. The insulation resistance and dielectric strength between each conductor and the shield ground is measured to insure there are no shorts. Each connector/cable interface is pull tested (4.5 to 7.5 pounds depending on connector size) to detect any workmanship problems which could cause a premature short circuit. Continuity testing of each conductor is performed after pull testing to insure there were no open circuits. PDA Test - The earphone lines are functionally checked during PLSS PDA testing per SEMU-60-010, Test 6.0, to insure there are no shorts to shield ground or opens which affect the performance of the earphones. Certification Testing - Certified for a useful life of 20 years (ref. EMUM1-0244). C. Inspection - To insure there are no workmanship problems which would cause a short or open circuit in the harness conductors, the following inspections are performed: Harness cables and conductors are visually inspected prior to assembly to insure there are no defects which could cause a short to ground or an open circuit due to defects in the cable insulation. Connector wiring is inspected before and after potting to insure there is no conductor damage and that the conductors are properly strain relieved to prevent conductor shorting to the adaptor ring or an open circuit. Insulation resistance and dielectric strength are measured between each conductor and shield ground to insure there are no shorts prior to and after potting of the connectors. Contact crimp samples are made prior to the start of contact crimping and at the conclusion of crimping and subjected to a pull test to insure the crimping tools are operating properly. This insures there will not be any high resistance problems at the conductor. D. Failure History - H-EMU-156-A001 (6/22/89) Low insulation resistance between earphone signal high conductor and grounded shield circuit. Disassembly of wire harness at J10A connector revealed earphone

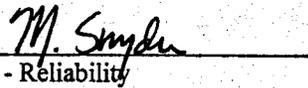
NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		156FM04		<p>high wire insulation damage which exposed wire. Caused by use of excessive force to pull the wire through the EMI shield. Secondary insulation (shrink tubing) at breakout point missing due to improperly positioned shrink tubing. RTDS harness manufacturing process modified to specify amount of exposed shield needed for proper shrink tubing installation and visual inspection points for wire breakout and shrink tubing assembly operations.</p> <p>B-EMU-156-A002 (2/29/00) - P10B connector outer housing found damaged during inspection of RTDS harness, such that it could result in a loose connection. Service instructions for incorporation of bowed washer (-2) configuration were inadequate, resulting in confusion of harness configurations allowing harnesses with grounding fingers to have bowed washers installed. Service Instruction SI-439 Rev. B screens 152, 153, and 156 harnesses. SI-439 rev. C identifies 152, 153, and 156 configurations per EC 42807-129-2.</p> <p>E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Final Pre-Flight Communications. FEMU-R-001 Para 8.2 EMU Preflight KSC Checkout for EET processing.</p> <p>F. Operational Use - Crew Response - PreEVA: Trouble shoot problem. If no success, consider third EMU if available, otherwise terminate EVA prep. EVA: When loss of minimum comm occurs, terminate EVA. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and system operational status prior to eVA. Flight rules require that EVA be terminated if two-way communication between each EV crewmember and orbiter, either direct or through relay, is unavailable.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-156 REAL TIME DATA SYSTEM HARNESS
CRITICAL ITEM LIST (CIL)

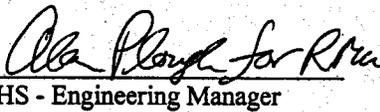
EMU CONTRACT NO. NAS 9-97150

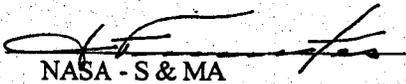
Prepared by: 
HS - Project Engineering

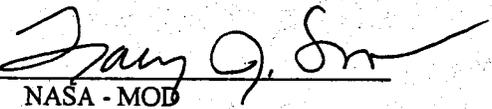
Approved by: 
NASA - SSA/SSM
ISS

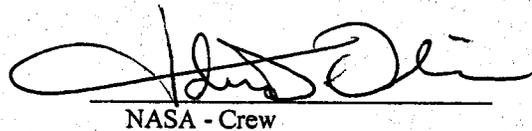

HS - Reliability

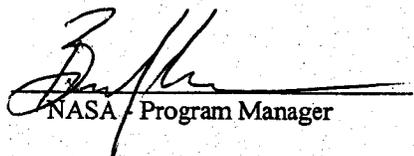

NASA - EMU/SSM


HS - Engineering Manager


NASA - S & MA


NASA - MOD


NASA - Crew


NASA - Program Manager